

## VALUE ADDITION OF THE KOTA DORIA THROUGH DESIGNING TECHNIQUES

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### ABSTRACT

*Creating something new is the need of the hour for the apparel industry. Bamboo was used as replacement of cotton yarn in this study considering its antimicrobial property, high breathability and thermo regulation property. Four new technique of designing i.e., colour and weave effect, double cloth, meenakari (extra warp and weft) and ikat (warp and weft) were utilized to prepare Kota Doria fabric in combination of bamboo and silk yarns. These techniques were used to develop five prototypes of female apparels. Result revealed that by utilizing these new techniques for Kota Doria, we can introduce designs which will give unique look and increase the marketability of the product.*

**KEYWORDS:** Kota Doria Fabric, Innovation, New Design Technique, Computer Aided Design

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### INTRODUCTION

#### Kota Doria

Kota Doria is light, airy and comfortable fabric which makes it first choice for the summer and its softness and transparency makes it graceful and part of fashion (Singh, 2009). It is also popularly known as Masuria Malmal. The Kota Doria weave, according to Kumar (2008) is special. The warp and weft use a combination of cotton and silk thread in the ratio of 5:1, this creates a fine chequered pattern. Checks are popularly known as 'khats'. The 'khats' are made so proficiently that the fabric becomes transparent (Fernandez, 2010). According to Russel (2006), Kota Doria woven with the 'Magical Finger' by the craftsman of Rajasthan is now one of the favourite choices of fashionist with its demand growing in the domestic and the international market. Indian and international designers are portraying the wide range of Kota Doria product in their creative collection.

Gupta (2005) has identified several key problems being faced by Kota Doria weaving sectors. Some of these are lack of contemporary designs, product diversification, and value addition. Market survey by investigator revealed that in addition to plain, printed and zari mixed Kota Doria, embroidery, tie-dye, batik techniques are used to embellish kota doria fabric. Now a day's consumers increasingly demand more personalised, desirable, efficient and sustainable products and services. The new design approaches in the textile industry have increased focus on the innovation and its process. The very basic elements of textile design, i.e., materials, construction, colour, form, etc., provide ample scope to the designers for innovations. The need is to explore our visual sensitivities and design vocabulary further (Katitar, 2009).

An endeavour has therefore, been made in this study for innovation in designing of kota doria through modification in material as well as design technique.

### **Value Addition using Combination of Bamboo- Silk Yarns**

Variation in Kota Doria can be done by using new bamboo yarns or combination of natural yarns for Kota Doria weaving.

Bamboo viscose, also known as regenerated bamboo, is a regenerated cellulosic fibre. In the last few years in the world market, more and more products from bamboo fibres have been appearing. Sheshachala et al. (2008) found that Bamboo fabrics exhibited better light fastness results than cotton fabrics. The lower flexural rigidity, bending modulus and drape coefficient results suggested that bamboo fabrics have a softer feel and better drape than cotton fabrics. Their results also indicated that bamboo fabrics have lower bursting strength, but higher abrasion resistance. Shaw (2013) reported that bamboo fiber has got unique combination of properties and is used to make apparels, home furnishing products and textile based products in medical applications. It is 100 % biodegradable and is extracted from bamboo plants which is a renewable source. There is need of a lot of research in the area of fiber and yarn manufacturing to reduce the cost of production and improve performance quality.

### **Innovation in Designing Techniques through Weaving**

Variation in designs of Kota Doria can be further brought about by using new techniques of designing such as colour and weave effect, double cloth, meenakari (extra warp and weft) and ikat (warp and weft).

#### **Ikat (Warp and Weft)**

The ikat are plain woven by tie and dye techniques: warp or weft yarns are divided into bundles, tied with a waterproof material to correspond with a pre-arranged design, tying warp and weft yarns to the pattern and tying resists into partially dyed yarns, yarns after dyeing and removal of the resists, setting up the warp after dyeing and repairing broken yarns and sizing the warp yarn, final arrangement of the warp in iron needles (Larsen, 1976).

#### **Colour and Weave Effect**

Colour and weave effect is the form or pattern in two or more colours produced by colour and weave in combination. It is frequently quite different in appearance from either the order of colouring or the weave. Classification of the orders of colouring the threads is as follows: (a) simple warping and simple wefting (b) simple warping and compound wefting (c) compound warping and simple wefting (d) compound warping and compound wefting. The style of pattern which is produced by the combination of each order of colouring with each type of weaves (Grosicki, 2004).

#### **Double Cloth**

A double cloth is composed of two component cloths, from two sets of warp threads and two sets of weft threads, woven simultaneously as one composite fabric. Occasionally the two warps may be fed into the loom from separate beams, but more often than not they are combined on one beam. Double-cloth construction permits fabric to be made where the face and back are different, either in terms of surface texture or colour (Moore, 2000).

#### **Meenakari (Extra Warp and Weft)**

Meenakari work includes designs that are created with extra warp and extra weft patterns in multicolour. Decorative effects are often attained through employing extra threads in a warp or weft direction, or occasionally in both directions (Watson, 1976).

### **Development of Designs on CAD Software**

Inui (1994) mentioned that the introduction of CAD to textiles has provided a major breakthrough in multicolour weave design. With the help of CAD, designers can display, examine, and modify ideas very quickly on the colour monitor before producing any real fabrics. Thus CAD allows a greater scope for free creative work on the part of designers without incurring a large cost increase. CAD allows a greater flexibility in the designer's work, and the designer's creativity is more effectively used.

## **MATERIALS AND METHODS**

### **Materials**

100% silk yarn of 332.3 Nm and 100% bamboo yarn of 64.6 Nm were used to prepare fabric.

### **Methods**

#### **Development of Designs**

Four woven designing techniques were used to design fabric: Ikat (warp and weft, colour and weave effect, double cloth weave and meenakari (extra warp and extra weft).

Forty innovative designs were developed for each designing technique with the help of CAD (Arahne software). Innovative designs are creative designs different from existing practices which include designing technique, motifs, placement, colour combination etc. Total two hundred designs were created for five articles.

Subjective analysis technique was used to evaluate the developed CAD designs. Designs were evaluated by fourteen textile designing experts. Four criteria were selected to rate the designs – Suitability of colour combination, Suitability of design technique, Innovation/creativity, Overall placement

Five point Likert type rating scale was used. Four most preferred designs (at least one from each designing technique) were selected to develop fabric for apparels.

#### **Preparation of Fabrics**

Kota Doria fabrics were manufactured in which bamboo and Silk yarns were used in warp and weft direction. Each khat had 14 threads (08 bamboo and 06 silk yarns). Fabrics were made with 325 khats across the width. Fabrics of 48 inch width were prepared.

#### **Development of prototypes**

Five clothing articles were selected for the study- Saree, Stole, Scarf, Top (Kurti), Skirt. Prototype of each article was prepared with one of the developed fabrics. Total five clothing articles were developed.

#### **Acceptability of Developed Designing Techniques**

In order to assess the acceptability of Kota Doria apparel prototypes, a ranking Performa was developed for this purpose. Two hundred twenty general costumers, thirty four industry persons including fashion designer, fashion coordinators, fashion merchandisers, retailers, production manager and garment exporters and ten textile experts were chosen. The Kota Doria prototypes developed were assessed on the basis of different criteria's. General consumers were asked to judge the prototypes on the basis of three criteria which were:

Suitability of colour combination, Suitability of design, overall aesthetic appeal

Industrial persons and textile experts were asked to judge prototypes on the basis of four criteria.

Suitability of colour combination, Suitability of technique for clothing article, Suitability of design, overall aesthetic appeal

The responses derived for Kota Doria apparel articles were coded and mean score was calculated. Cost of each apparel was also calculated and its appropriateness was evaluated.

## RESULTS AND DISCUSSIONS

### Acceptability of CAD Designs of the Kota Doria

Four techniques were selected to impart unique/innovative look to Kota Doria. These were: colour and weave effect, meenakari (extra warp and weft), double cloth and ikat (warp and weft). Five apparel articles were chosen to be developed from Kota Doria fabrics manufactured with new designing techniques. Ten designs for each article in each technique were created. Thus total two hundred designs were created. These were subjected to evaluation by experts from design field. The evaluation was done on the basis of four criteria and weighted mean score was calculated. Results is shown with Figures-

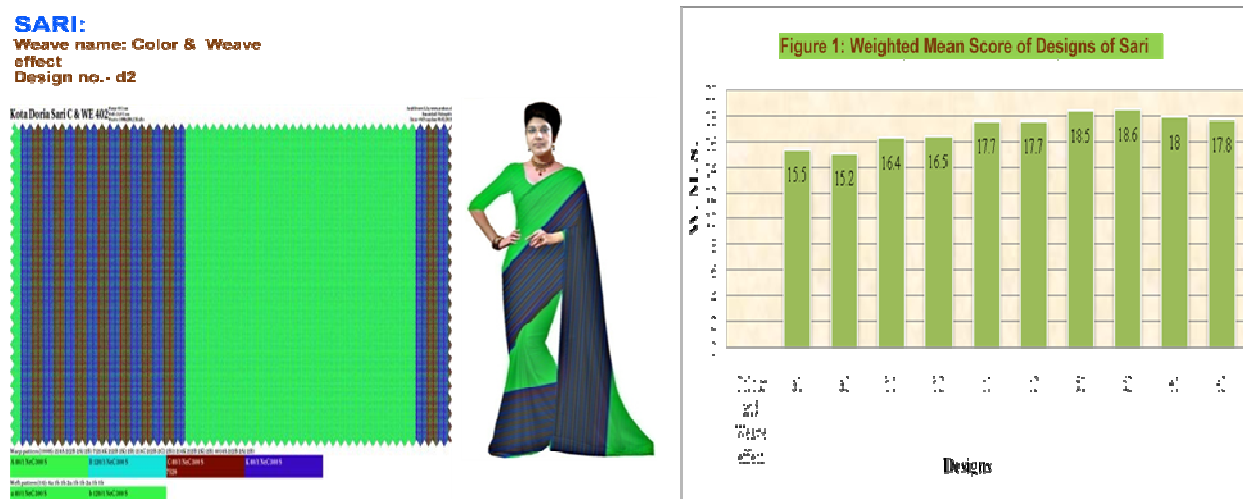


Figure 1

Figure 1 Shows that Design d2 in Colour and Weave Effect has got Highest Weighted mean Score among four Techniques therefore this Design has been selected for Development of Kota Doria Sari by Colour and Weave Effect Technique.

**SCARF:**

Weave name: Meenakari (extra warp)  
Design no.- d2

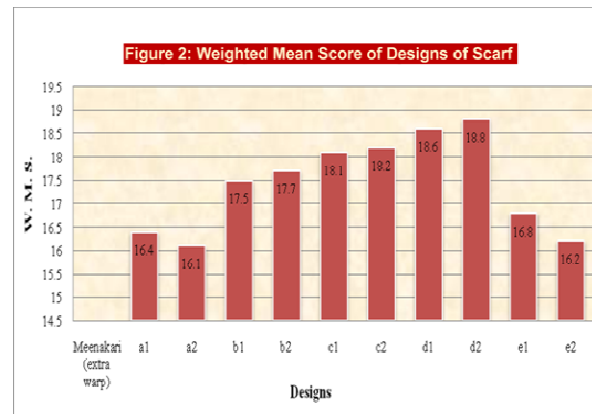
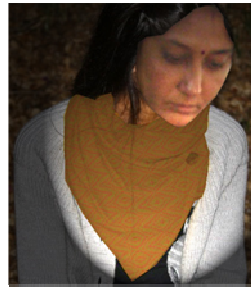
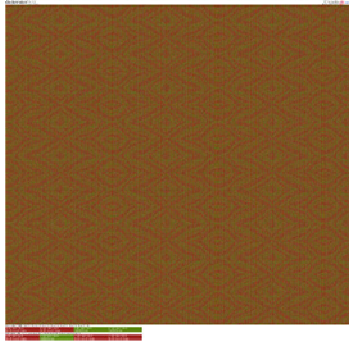


Figure 2

It is clear from Figure 2 that in case of scarf, design d2 in meenakari technique has obtained highest weighted mean score of 18.8 so this design has been selected for production of Kota Doria fabrics for scarf.

**WRAP AROUND SKIRT:**

Weave name: extra weft  
Design no.- e1

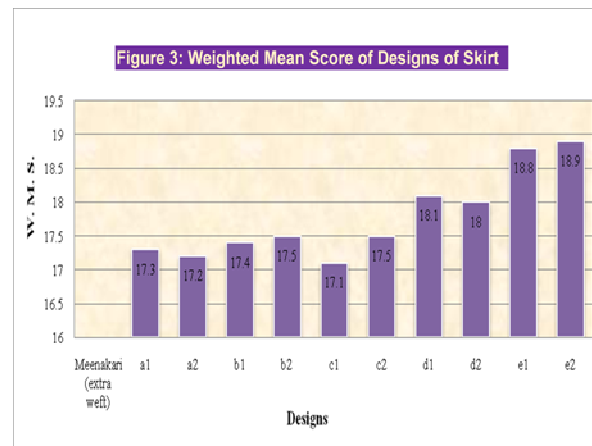
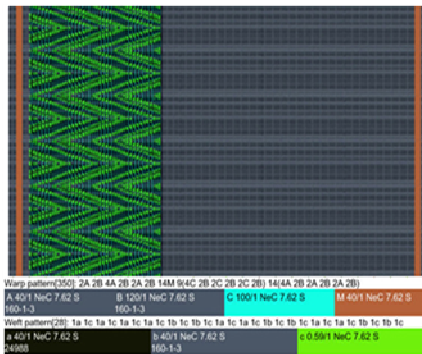


Figure 3

Weighted mean score obtained by designs of skirt (plazo) in different categories presented in Figure 3 shows that design e2 in extra weft technique has been rated highest by experts therefore this has been selected for development of fabric for skirt (plazo).

**STOLE:**

Weave name: Double Cloth  
Design no.- c1

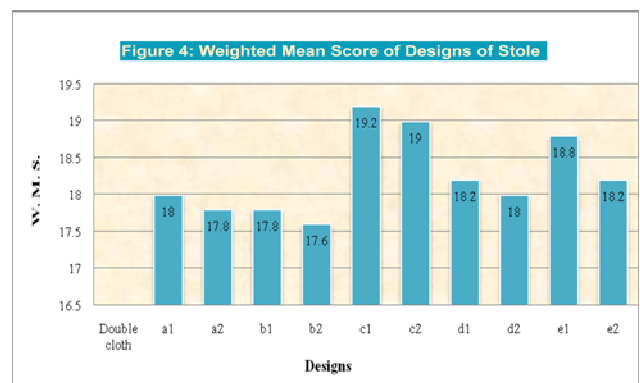
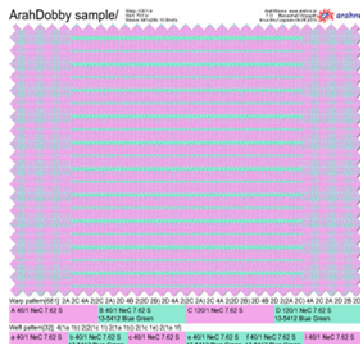
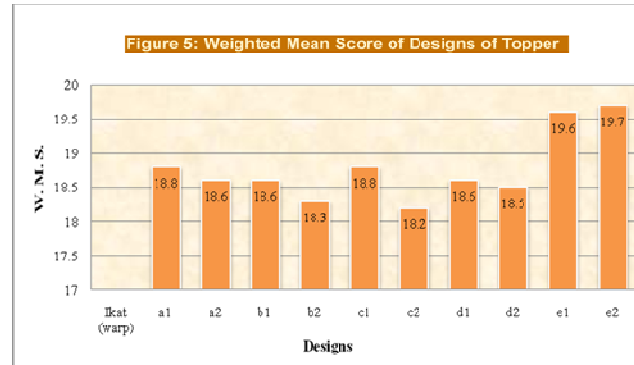
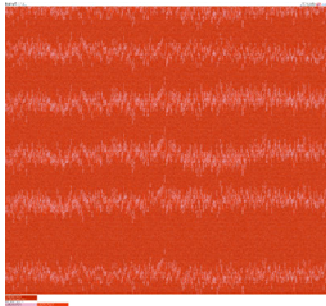


Figure 4

It is clear from Figure 4 that design c1 in double cloth has got highest weighted mean score for stole whereas Figure 5 that design e2 in ikat effect has got highest score for topper. These two designs are selected for production of fabrics in their respective category.

**ORANGE TOP**  
Weave name: Warp ikat  
Design no.- e1



**Figure 5**

### Acceptability of Prototypes of Garments

The Kota Doria prototypes developed were assessed on the basis of different criteria's such as suitability of colour combination, suitability of technique for clothing article, suitability of design and overall aesthetic appeal. Cost of each apparel was also calculated.

**SARI: (Colour and Weave Effect Technique)**



**Prototype 1**

**SCARF: Meenakari (Extra Warp Technique)**



**Prototype 2**

**Figure 6**





Figure 7

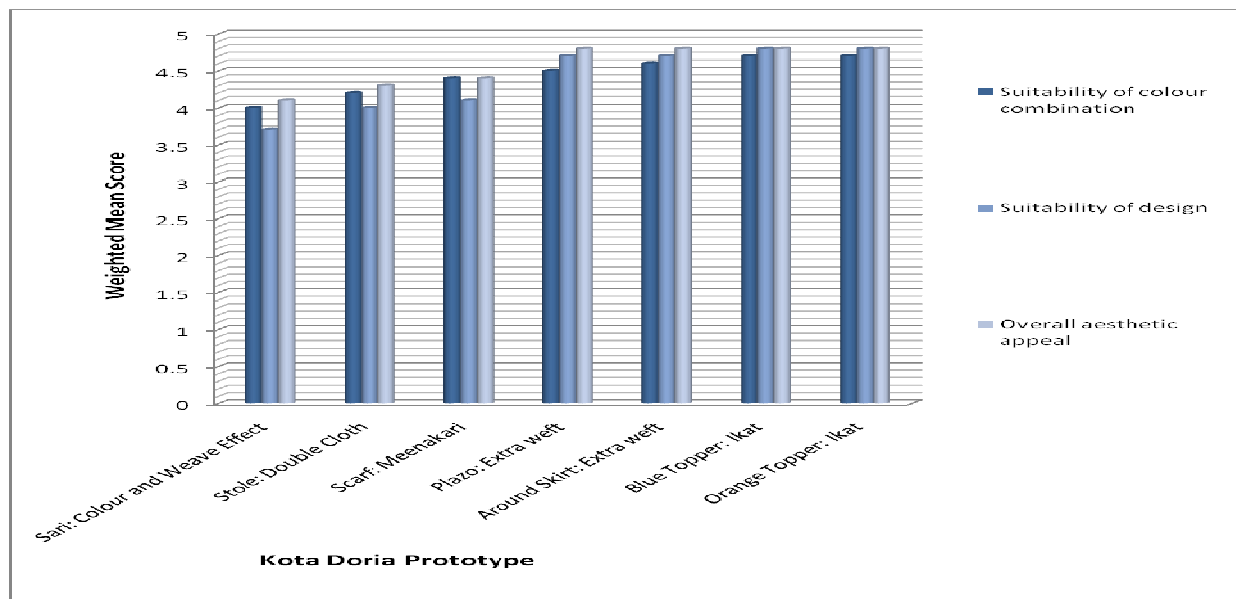
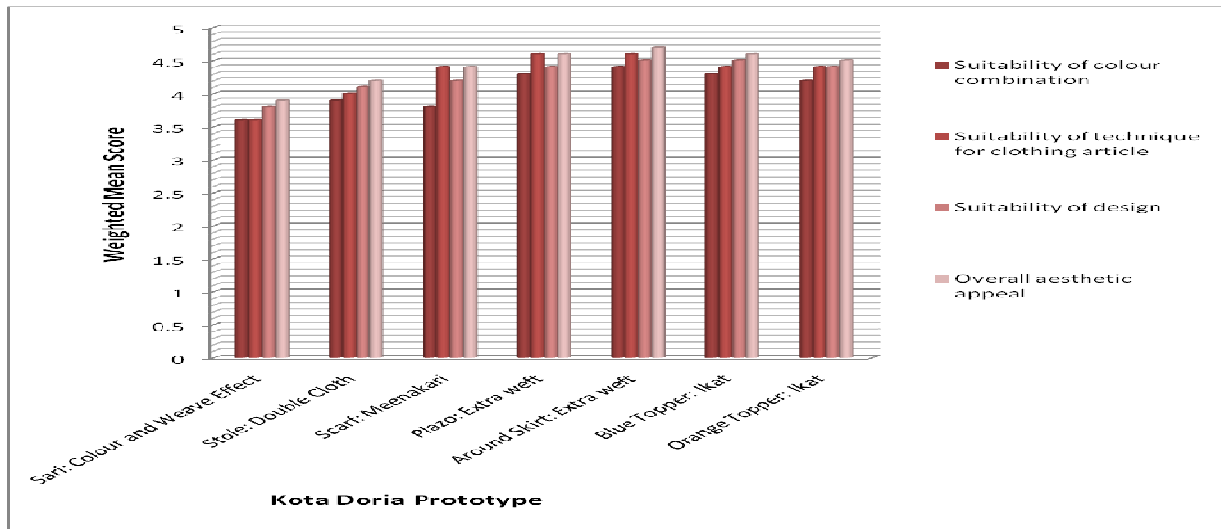


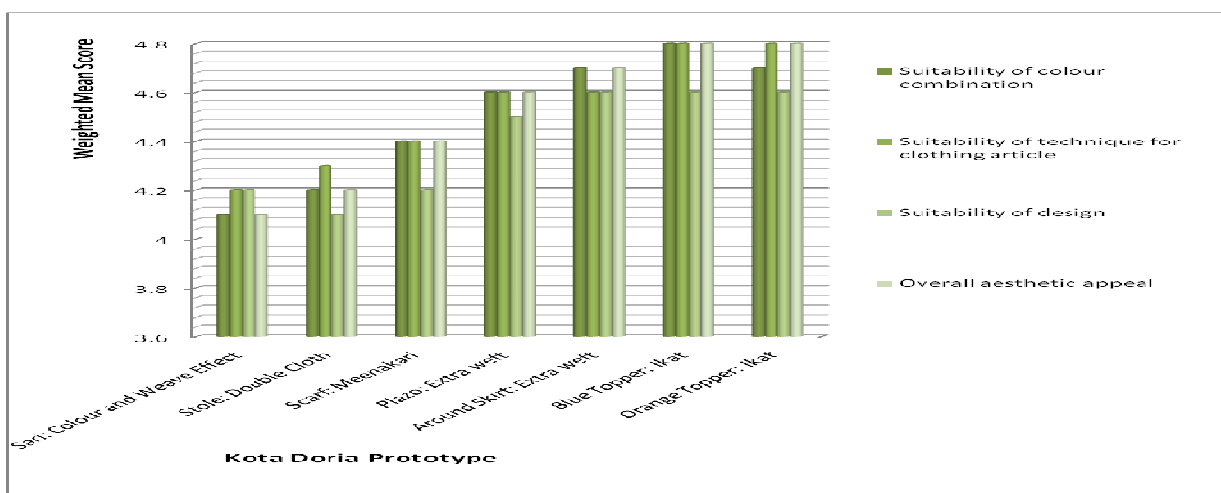
Figure 8: Weighted Mean Score of Kota Doria Prototype by General Consumers

Figure 8 depicts the weighted mean score of developed seven articles of Kota Doria as judged by general Consumers. It is evident that all the articles have been rated good to excellent as weighted mean score ranges from 4 to 5. However, comparative analysis reveals that top have been rated best followed by palazzo, skirt. Next order of preference is for stole, scarf and sari respectively.



**Figure 9: Weighted Mean Score of Kota Doria Prototype by Industry Persons**

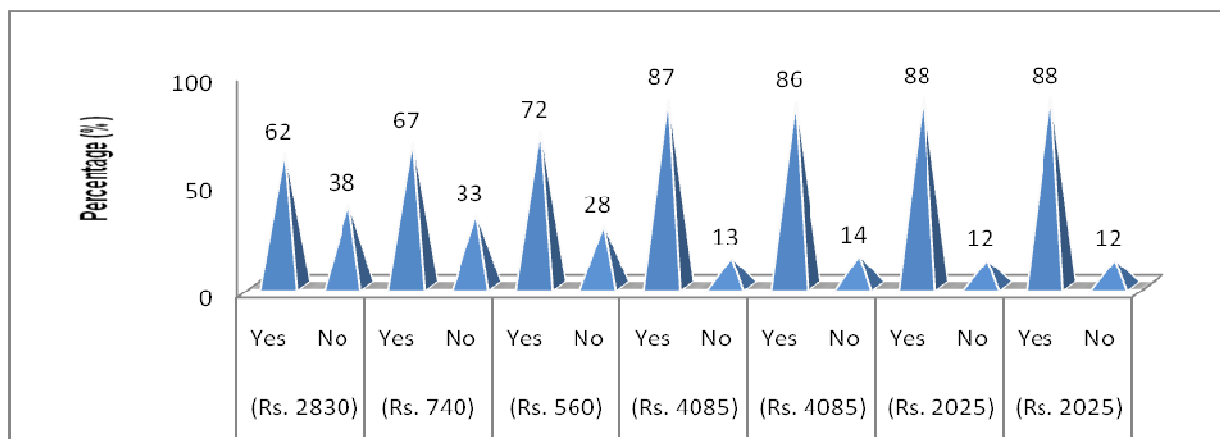
Figure 9 depicts the mean score of developed articles of Kota Doria as judged by industry persons. Weighted mean score varying from 3.5 to 4.5 has been obtained by different Kota Doria prototypes. Thus it can be said that they have been rated good to very good. The order of rating of articles is: skirt > palazzo > blue top > orange top > sarf > stole > sari



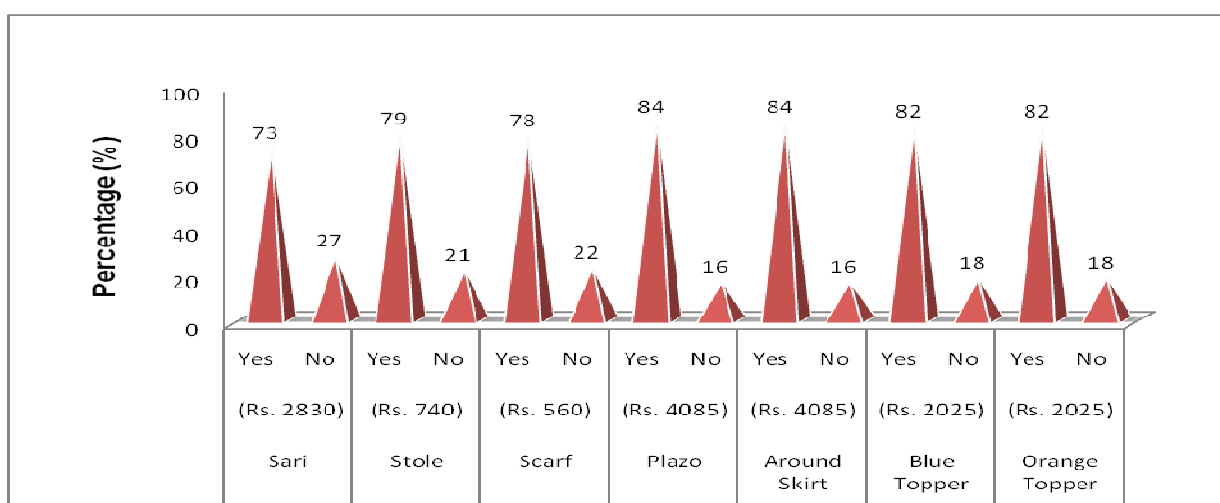
**Figure 10: Weighted Mean Score of Kota Doria Prototype by Textile Experts**

Figure 10 shows rating of Kota Doria articles by textile experts. Textile experts have also judged articles from good to excellent as is evident from weighted mean score. Rating trend of different articles is similar to that of customers i.e. toppers have been rated highest followed by skirt, scarf, stole and sari in this order. However, suitability of design has been rated less among all the four criteria.

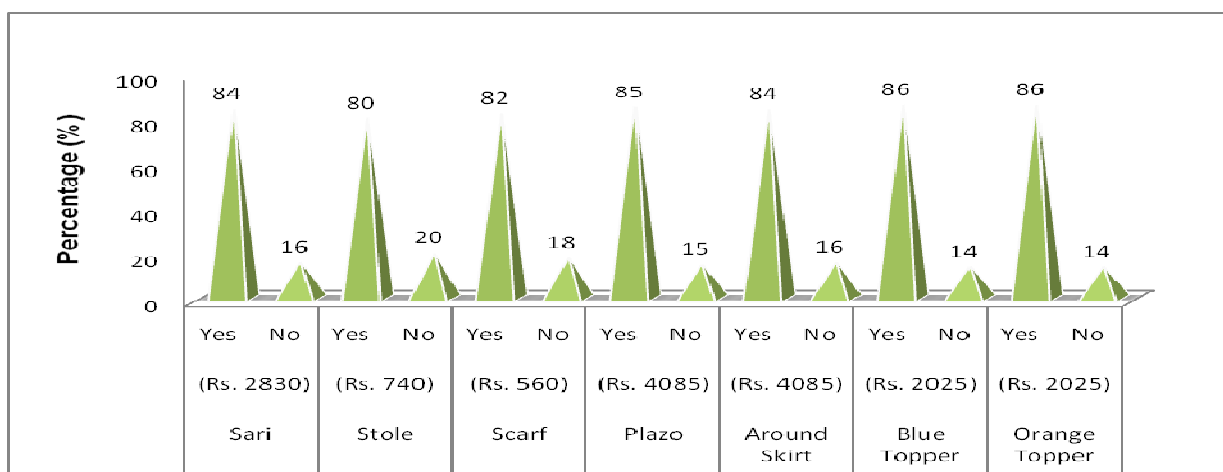




**Figure 11: Appropriateness of Cost Judged by General Consumers**

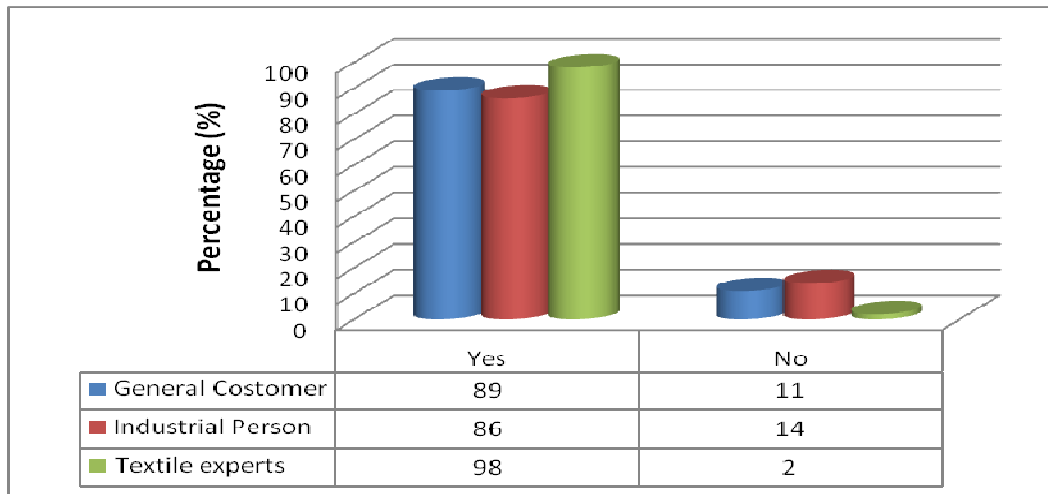


**Figure 12: Appropriateness of Cost Judged by Industry Persons**



**Figure 13: Appropriateness of Cost Judged by Textile Experts**

Cost of Kota Doria articles ranges from Rs. 560 of scarf to Rs. 4085 of Palazzo. Figure 11, 12 and 13 shows that 62 to 88 % consumers have found cost of articles appropriate whereas most of the (73 to 84 %) industry persons have rated cost appropriate. Figure 11 clearly depicts that the majority (80 to 86 %) of the textile experts have found cost suitable.



**Figure 14: Readiness to Purchase the Articles**

Willingness to purchase articles of Kota Doria has been asked from respondents as it directly or indirectly shows acceptability of products. Result has been depicted in Figure 14. It is clear that majority of respondents are ready to purchase these articles.

## CONCLUSIONS

It can be concluded that the articles designed and developed in this study were liked by the respondents as was evident from rating of the criteria of colour combination, technique for clothing article and designs which were found suitable. Therefore, overall aesthetic appeal was rated good to excellent. Cost was found appropriate by most of the respondents and majority was ready to buy them. Thus it can be interpreted that designing technique used in the work were successful and will help in improving the aesthetic appeal of apparel articles. The study is a successful innovation in Kota Doria weaving designing techniques and imparting novel and unique look to the Kota Doria apparel articles.

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